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specialist to have assembled here, in well-rounded form, the results of the many voluminous memoirs that Duhem has published during the past dozen years.

The book, on the whole, has been carefully written. It gives a good general view of its subject; many of its features are new, both in form and in matter; and it gives everywhere evidence of great erudition. One serious objection only is to be made to it: its style is diffuse. The whole thing might have been written in fewer words, and with fewer equations.

J. E. TREVOR.

LEÇONS DE CHIMIE PHYSIQUE, PROFESSÉES A L'UNIVERSITÉ DE BERLIN. By *J. H. van't Hoff*. Translated from the German by M. Corvisy. Première partie: La Dynamique chimique. Paris: A. Hermann. 1898.

Two very important treatises on physical chemistry are now appearing in parts. One of these is Ostwald's enormous *Lehrbuch*, the other is van't Hoff's *Lectures on Theoretical and Physical Chemistry*. Both are written in German; but in the present volume we have a French translation of the First Part of van't Hoff's book. These two authors being, probably, the best known teachers and investigators in physical chemistry, comprehensive works by them on the subject have an unusual interest.

Van't Hoff's book presents substantially its author's lectures at the University of Berlin, but expanded somewhat beyond their original limits. Its subject-matter is assembled in three parts, under the heads, "chemical dynamics," "chemical statics," and "composition and properties of matter." The present first part, on chemical dynamics, treats of "the mutual actions of bodies, chemical transformation, affinity, the velocities of reactions, and chemical equilibria," thus comprising the greater part of what is commonly understood as physical chemistry. The two remaining parts will almost necessarily contain a lot of incoherent details, and a collection of the hypothetical lumber of the subject—"the constitution of matter atoms, molecules, and the structure and configuration of molecules."

In presenting each topic, van't Hoff begins with an experimental study of a concrete example, usually one that has been investigated in his own laboratory; then represents graphically the results that are obtained; and, finally, draws his general conclusion and elaborates its theoretical development. This natural method, together with the clearness with which the book is written, are certain to make it what its author intended it to be: "An aid to those who wish to assimilate the recent achievements of physical chemistry."

J. E. TREVOR.

CALCUL DE GÉNÉRALISATION. By *G. Oltramare*, Doyen de la Faculté des Sciences de l'Université de Genève. Paris: Librairie Scientifique. A. Hermann, rue de la Sorbonne 8. 1899. Pages, 191.

The present work is one belonging to higher analysis, and will claim the attention of advanced mathematicians and logicians only. *The Calculus of Generalisation*, which is the name that Dr. Oltramare has given to his science, is con-

cerned with the representation of uniform functions under a symbolical form such that the principal operations to which functions may be subjected, as differentiation and integration, can be effected by means of a simple algebraical analysis which is very easily manipulated. He claims for his Calculus the establishment of general formulæ for the determination of definite integrals, of which Cauchy has given several examples; the establishment of formulæ for the transformation of series into definite integrals; its easy application to the integration of equations; and so forth, and so forth. The author contends that his methods bear the same relation to higher analysis that logarithms do to arithmetical computation, diminishing in many cases the difficulties of differentiation and integration. And he further believes that his discipline ought to find an important place in the curriculum of higher mathematical study.

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KANT UND HELMHOLTZ. Populärwissenschaftliche Studie. Von *Ludwig Goldschmidt*, Ph. D., Mathematischem Revisor der Lebensversicherungsbank für Deutschland in Gotha. Hamburg und Leipzig: Verlag von Leopold Voss. 1898. Pages, xvi+135. Price, 5 M.

Students of epistemology will find this booklet of Dr. Goldschmidt to be one well worth perusal. Though making no pretence to being more than a popular discussion, it has many solid merits. Dr. Goldschmidt is consulting actuary of the National Life Assurance Association of Germany, in Gotha, is an enthusiastic Kantian, and remarkably well versed in the literature of the Kantian epoch. He upholds the Kantian theory of space against the attacks of the modern metageometricians, impugns the theory that the axioms of geometry are empirical in character, and adopts the Kantian theory of *a priori* judgments in its entirety. With all his great admiration for Gauss, Riemann, and Helmholtz, he yet claims that their achievements must be subjected to the analytical tests which the Sage of Königsberg established for all knowledge.

The mere suggestion of a parallel between Kant and Helmholtz brings with it the most varied philosophical implications; and the applicability of the parallel to the problems now engaging attention in the theory of knowledge is directly evident.

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PSYCHOPHYSIOLOGISCHE ERKENNTNISTHEORIE. Von *Dr. Theodor Ziehen*, Professor in Jena. Jena: Gustav Fischer. 1898. Pages, 105. Price, M. 2.80.

It is no easy task to follow Professor Ziehen through the labyrinth of his arguments let alone to condense the results of his epistemological investigations. It is difficult to argue with a man to whom the terms "psychical," "conscious," and "real" or "actually existing" are identical and in whose philosophy "extra-psychical non-psychical objects have no existence." Professor Ziehen reduces sensations and perceptions to two components, "the reduction-ingredient" so called, and "the ν component," the latter being a learned name for the epistemological